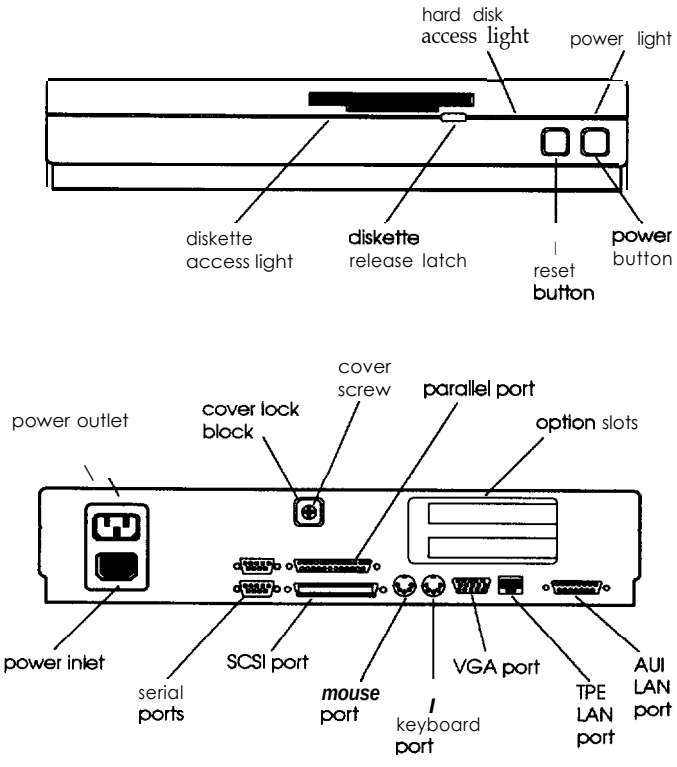


Computer Specifications

CPU and Memory

CPU	Intel 25 MHz 486SX, or 33 MHz 486DX microprocessor; simulated 8 MHz processor speed selectable through software or keyboard command
System memory	4MB RAM standard on one 4MB SIMM; expandable using 1MB, 2MB, 4MB, or 8MB SIMMs up to 32MB (when 8MB SIMMs are available); SIMMs must be 80ns, 36bit, 72-pin, gold-leaded, fast-page mode type
BIOS	256KB two-part system BIOS including video BIOS in two FLASH ROM devices; write-protection available through jumper and software
Video RAM	1MB standard
Cache memory	8KB internal cache integrated into the microprocessor; optional 128KB Intel 485 Turbo Cache module can be installed on main system board (128KB cache module standard on 486/33 model); write-through, two-way set associative cache memory and controller; operation controllable through software
Math coprocessor	Socket for optional Intel 25 MHz 487SX coprocessor (allowable on 486SX/25 model only)
Shadow RAM	Optional shadow RAM to copy system, video, or external BIOS information from ROM to RAM; software selectable
Clock/calendar	Socketed DS1287 real-time clock, calendar, and 64-byte CMOS RAM for configuration; integrated battery with IO-year life

Interfaces

Monitor	15-pin, D-shell analog connector; supports standard VGA, multi-frequency, and high-resolution monitors
Parallel	25-pin, D-shell connector; supports IBM AT compatible or PS/2 compatible (bidirectional) signals; selectable through software
serial	Two RS-232-C 9-pin, D-shell connectors; asynchronous; up to 56K baud rate
SCSI	Internal connector for SCSI hard disk drive on drive riser card (single-ended mode only), terminator soldered onto riser card; external SO-pin, fine-pitch connector on back panel for up to seven external SCSI devices (six if internal device is used); external SCSI terminator included
LAN	One 15-pin AUI (Attachment Unit Interface) D-sub connector; can connect external MAU (Medium Attachment Unit) to provide interface with other networks
	One TPE (Twisted Pair Ethernet), 10BASET connector
Mouse	Mini DIN, 6-pin connector for PS/2 compatible mouse or other pointing device
Keyboard	Mini DIN, 6-pin connector for PS/2 compatible keyboard
Option slots	Two 32-bit EISA expansion slots (16-bit and 8-bit ISA compatible) on option card riser board
Speaker	Internal speaker integrated into power supply; programmable at I/O port 61h; operation controllable through software

Controllers

Diskette	Controller on drive riser board supports one 3.5 inch 1.44MB, third-height diskette drive
Hard disk	Two interfaces on drive riser board support either one IDE drive or one internal SCSI hard disk drive; 3.5inch, third- or half- height form factor
Video	WD90C30 controller; supports resolutions up to 1024 x 768 in 256 colors; compatible with MDA, CGA, Hercules, EGA, and VGA standards

LAN — Intel 82596CA, 64-byte transmit FIFO, 128-byte receive FIFO; 6-byte Ethernet address per IEEE 802.3 standard stored in write-protectable FLASH ROM; 25 MHz or 33 MHz operation, based on CPU speed

SCSI — NCR 53C700 I/O processor for SCSI-II standard; internal FIFO (first-in-first-out), 32-bit address and data busses, internal SCRIPTS processor with fast DMA; 25 MHz or 33 MHz operation, based on CPU speed

Mass Storage Bays

Up to two internal devices maximum, one third-height, 3.5-inch diskette drive bay; one third- or half-height, 3.5-inch hard disk drive bay for IDE or SCSI drive

Can connect up to seven optional external SCSI devices to external SCSI connector (six maximum if internal SCSI is used)

Keyboard

Detachable, two-position, 101 or 102 sculpted keys

Layout — Countrydependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys

Power Supply

Type — 142W, fan-cooled, automatic input voltage sensing male AC input socket, female AC output socket; integrated power and reset buttons, panel LEDs, speaker, and fans

Input ranges — 90 to 132 VAC and 180 to 264 VAC, 47 to 63 Hz

Option slot power limits — Maximum amperage for cards in both option slots: at +5V, 6 Amps; at +12V, 2 Amps; at –5V, 0.3 Amps; at –12V, 0.3 Amps

Power supply current ratings

Voltage	Maximum continuous current	Peak surge for 15 seconds
+5 Volts	20 Amps	—
–5 Volts	0.4 Amps	—
+12 Volts	3 Amps	4.5 Amps
–12 Volts	0.4 Amps	—

Environmental Requirements

Condition	operating range	Non-operating range
Temperature	50° to 104° F (10° to 40° C)	–40° to 158° F (–40° to 70° C)
Humidity	85° RH maximum with no hard disk; with herd disk, not to exceed 78° F (26° C) wet bulb	95° RH maximum et 104° F (40° C)
Altitude	to 10,000 ft (3,048 m)	to 60.000 ft (15.240 m)

Power Source Requirements

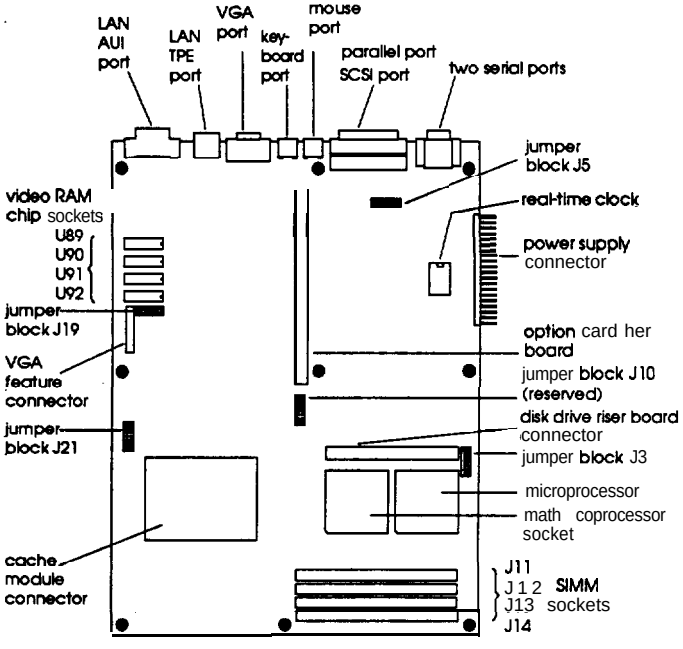
120-Volt power source requirements

AC plug	Plug type	Reference standards	Power cord
	North America 125V, 10A	ANSI C73.11, NEMA 5-15-P, IEC 83	UL/CAS Listed, Type SJT, no.18/3AWG, or no. 16/3AWG, or <HAR> 300V, 1 OA or 13A

Physical Characteristics

Width	15.5 inches (39 cm)
Depth	15 inches (38 cm)
Height	3 inches (8 cm)
Weight	20 lb (9 kg) without peripheral devices

Main System Board Map



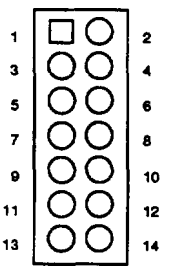
Main System Board Jumpers

The computer contains four blocks (groups) of jumpers: J3, **J5,** **J19,** and J21. To access jumper blocks **J19** and **J21,** you must remove any option cards that are installed. You must remove the drive housing to access jumper blocks J3 and **J5.**

Caution

Do not install or ***remove*** *any option cards when the* ***drive*** *housing is removed from the computer. The housing stabilizes the option card riser board and you could severely damage it if you put stress on it without the support of the drive housing. Also, do not change the settings in the reserved jumper block* ***J10;*** *these jumpers must remain at their factory* settings.

Each jumper block consists of 14 jumper pins, as shown below. Certain pin numbers and jumper functions are **labelled** beside each jumper block on the main system board.



The tables below list the jumper settings available in each jumper block.

J3 *Settings*

Jumper pins	Function
2 - 4	**Write-protects** the **diskette drive** to prevent unauthorized **downloading of** software onto a diskette
4 - 6 '	**Enables** all **writes to** the **diskette drive**

J5 *Settings*

Jumper pins	Function
2 - 4*	**Enables the update of the FLASH BIOS memory area (Note: Because the SETUP program and System Configuration utility write to the FLASH memory, this jumper must be set to position 2-4 before you can run the programs.)**
4 - 6	**Write-protects the FLASH BIOS memory to prevent alteration of its data**

J19 *Settings*

Jumper pins	Function
1 - 3*	**Indicates** that you are using the standard **512KB** size video **RAM**
3 - 5	Indicates that you have installed **additional** video RAM **chips to increase your video RAM size to 1MB**
2 - 4*	Enables the bulk-in VGA display adapter
4 - 6	Disables the **built-in** VGA display adapter

* **Factory** setting

J21 *Settings*

Jumper pins	Function
i - 3 '	Enables you to use the BIOS SETUP program
3 - 5	Disables use of the BIOS SETUP program so unauthorized **users cannot change the** settings you have chosen
2 - 4	Clears the power-on password
4 - 6	Retains the power-on password
9-11	Clears the current **BIOS** SETUP information in CMOS memory and sets **default** parameters
11 - 13*	Retains the current BIOS SETUP information in CMOS memory
10 - 12*	Sets normal FLASH memory operation
12 - 14	Sets the FLASH memory **to** operate in recovery mode **if** you unsuccessfully attempted lo download updated BIOS information; allows **start** of a procedure lo restore the previous BIOS information

* Factory setting

Main System Board Connectors

J1-Internal Serial Port 1 Header

Type: 3M style header, double row (Male)

2 GND	4 DTR	6 **Serial** Data Out	6 **Serial** Data In	**10 RLSD**	**12 N/C**	**14 N/C**
1 N/C	**3 RI**	5 CTS	7 RTS	9 DSR	**11 N/C**	13 **N/C**

J2-Power Connector

Type: Single Row Header Style (Male)

Pinout:

1	**RAWST**
2	**+5**
3	**+12**
4	*-12*
5	GND
6	GND
7	GND
8	GND
9	*-5*
10	**+5**
11	**+5**
12	**+5**
13	**+5**
14	**+5**
15	GND
16	GND
17	-12
18	**HD Active**
19	Front Panel Reset
20	Speaker Data

J4-Dual Serial Port Connector

Type: Stacked Dual 9-Pin D-sub (Male)

Pinout: PC AT standard

J6A-Parallel Port

Type: 25-pin Centronics type (Female)

Pinout: PC AT standard

J6B-External SCSI Port Connector

Type: Fine pitch, 50 pin **SCSI-2** (Female)

Pinout:				
	1	GND	26	Data 0
	2	GND	27	Data 1
	3	GND	28	Data 2
	4	GND	29	Data 3
	5	GND	30	Data 4
	6	GND	31	Data 5
	7	GND	32	Data 6
	8	GND	33	Data 7
	9	GND	34	Data Parity
	10	GND	35	GND
	11	GND	36	GND
	12	GND	37	GND
	13	N/C	38	Terminator Power
	14	GND	39	GND
	15	GND	40	GND
	16	GND	41	SCSI Attn
	17	GND	42	GND
	18	GND	43	SCSI Busy
	19	GND	44	SCSI Ack
	20	GND	45	SCSI Rst
	21	GND	46	SCSI Msg
	22	GND	47	SCSI Sel
	23	GND	48	SCSI CD
	24	GND	49	SCSI Req
	25	GND	50	SCSI IO

J8-PS/2 Mouse Connector

Type: **PS/2** (Female)

Pinout:		
	1	Data
	2	N/C
	3	GND
	4	+5
	5	Clock
	6	N/C
	7	GND
	8	GND
	9	GND

J15--PS/2 Keyboard Connector

Type: PS/2 (Female)

Pinout:		
	1	Data
	2	N/C
	3	GND
	4	+5
	5	Clock
	6	N/C
	7	GND
	8	GND
	9	GND

J16-VGA Video Connector

Type: 15-pin miniature D-sub (Female)

GND	N/C	Blue	Green	Red
GND	N/C	GND	GND	GND
N/C	Vert. Sync.	Horiz. Sync.	N/C	N/C

J17-Twisted Pair Ethernet Connector

Type: **RJ-45** (Female)

Pinout:		
	1	TX+
	2	TX-
	3	RCV+
	4	N/C
	5	N/C
	6	RCV-
	7	N/C
	8	N/C

J18-AUI Ethernet Connector

Type: **15-pin** D-sub (Female)

GND	N/C	GND	DI-A	GND	DO-A	CI-A	GND
WC	GND	VFAUI	DI-B	GND	DO-B	CI-B	

J20—VESA Video Pass-thru Connector

Type: 3M style, double row header, 26 pin (Male)

Data 0	Data 1	Data 2	Data 3	Data 4	Data 5	Data 6	Data 7
GND	GND	GND	DEN	SYNC EN	DOTC EN	N/C	GND
DOTC BLANK		VBHSR	VBVSR	GND			
GND	GND	GND	N/C	N/C			

Miscellaneous

Video Modes

Mode#	Resolution	Colors	Font	Clock	Vertical refresh
21/54H	132col x 43rows	16	9x9	44.9MHz	
41H	80col x 34rows	16	9x9	44.9MHz	
47H	132col x 28rows	16	8x16	44.9MHz	
55H	132col x 25rows	16	8x16	44.9MHz	
56H	132col x 43rows	4(mono)	9x9	44.9MHz	
57H	132col x 25rows	4(mono)	8x16	44.9MHz	
58/6AH	800 x 600	16	8x8	36MHz 40MHz 50MHz	56Hz 60Hz 72Hz
5AH	1024 x 768	2	8x16	44.9MHz 65MHz 75MHz	Interlaced Non-interlaced @ 60Hz Non-interlaced @ 70Hz
5CH	800 x 600	256	8x8	36MHz 40MHz 50MHz	56Hz 60Hz 72Hz
5DH	1024 x 768	16	8x16	44.9MHz 65MHz 75MHz	Interlaced Non-interlaced @ 60Hz Non-interlaced @ 70Hz
5EH	640 x 400	256	8x16	25MHz	
5FH	640 x 480	256	8x16	25MHz	
60H	1024 x 768	256	8x16	44.9MHz 65MHz 75MHz	Interlaced Non-interlaced @ 60Hz Non-interlaced @ 70Hz

System Current usage

System power usage	+5 Volts current usage	–5 Volts current usage	+12 Volts current usage	–12 Volts current usage
Baseboard	5.7 A (max) 2.6 A (typical)		0.5 A (max)	0.02 A (max)
Keyboard	0.5 A (max)			
Mouse			0.01 A (max)	
i487SX Coprocessor	0.8 A (max)			
i485 TurboCache Controller	1.2 A (max)			
SIMMs (4 modules)	2.0 A (max)			
3.5' 1.44 Meg TEAC Floppy	0.7 A (max)			
Hard disk drive	0.75 A (max)		2.1 A Peak 0.00 A (max)	
2 EISA Expansion Slots	6 A (max)	.3 A (max)	2 A (max)	.3 A (max)
Maximum system current usage	17.65 A (max)	.3 A	2.1 A Peak 3.31 A Max.	0.32 A

System I/O address map

I/O address	Function	I/O device
0CC0-0CFF	SCSI control registers	NCR 53C700
0CB8-0CBF	Reserved	
0CB0-0CB7	LAN control registers	82596CA
0C80-0C83	System Ward ID bytes (read only)	
0C26-0C27	CLASIC registers (optional location, see 0026-0027)	CLASIC
0C03	CLASIC control port C	CLASIC
0C02	CLASIC control port B	CLASIC
04F4-04FF 04E0-04EF	DMA controller stop registers	62357
04D4-04D7	DMA controller 2 extended registers	02357
04D0-04D1	Interrupt edge/level control	02357
04C2-04CF	D M A controller 2 extended registers	82357
0480-048F	DMA high page register	62357
0464-0465	Last Bus Master granted (read only)	82357
0462	Software NMI register (write only)	82357
0461	Extended NMI and Reset control register	162367
0400-040F	DMA controller 1 extended registers	62357
03F8-03FF	Serial port 1	WD 16C552
03F0-03F7	Floppy disk controller	82077AA
03E8-03EF	Serial port 3	Exp. card
03B0-03DF	Onboard video controller	WD 90C30
0378-037F	Parallel port 1	WD 16C552
0370-0377	Secondary Floppy disk controller	Exp. card
02F8-02FF	Serial port 2	WD 16C552
02F8-02E8	Serial port 4	Exp. card
0278-027F	Parallel port 2	Exp. card
01F0-01F7	IDE interface ports	IDE drive
00F8-00FF 00F0	Numerics coprocessor	i486/i847SX
00C0-00DF	DMA controller 2	62357
00A0-00A1	Interrupt controller 2	82357
0092	CLASIC control port A	CLASIC
0080-008F	DMA lower page register	62357
0070	CLASIC BIOS counter	CLASIC
0070-0071	Reel-time clock	DS 1267
0070	NMI enable register (write only)	62357
0061	NMI status register	82357
0060, 0064	Keyboard/mouse controller	0742
0048-004B	Interval timer 2	62357
0040-0043	Interval timer 1	62357
0026-0027	CLASIC index registers (relocatable to 0C26-0C27)	CLASIC

System I/O address map

I/O address	Function	I/O device
0022-0023	DRAM controller registers	62352
0020-0021	Interrupt controller 1	02357
0000-000F	DMA controller 1	02357

DMA Controller

Direct memory access (DMA) improves system performance by allowing devices to access the system memory directly. This ability is provided by two 82C37-compatible direct memory access controllers (DMACs) contained in the 82357. The seven independent 32-bit DMA channels are listed in the table below along with their associated DMA controller and their device assignments.

DMA request level

Level	Assigned device
DRQ 0 (CTRL1)	Spare
DRQ 1 (CTRL1)	SDLC
DRQ 2 (CTRL1)	Diskette drive controller
DRQ 3 (CTRL1)	Spare
DRQ 4 (CTRL2)	(Cascade for CTRL1)
DRQ 5 (CTRL2)	Spare
DRQ 6 (CTRL2)	Spare
DRQ 7 (CTRL2)	Spare

System interrupts

Interrupt request	Function/system only	EISA bus pin
NMI	Parity Error	
0	Reserved, Interval Timer	
1	Reserved, Keyboard buffer full	
2	Reserved, Cascade Interrupt from slave PIC	
3	on-w Serial Port 2	119
4	on-w Serial Port 1	110
5	User available	117
6	On-W Floppy	116
7	On-W Parallel Port	115
6	RTC	
9	Optional SCSI/LAN	98
10	Optional SCSI/LAN (default LAN)	126
11	Optional SCSI/LAN (default SCSI)	129
12	On-bd Mouse Port if enabled. else user available	130
13	Reserved, Math coprocessor	
14	User available	132
15	Optional SCSI/LAN	131

Notes:

- IRQ 9, 10, 11, and 15 can be set via the ECU for user available, on-board LAN, or on-board SCSI.
- IRQ 0, 1, 2, 6, and 13 cannot be used by an add-in card. In PC-XT compatible systems, IRQ 2 was available br use m the XT bus. In PC-AT compatible systems, IRQ 2 is not available for use on the bus. Some older ISA expansion boards have an option to use IRQ 2. This should not be selected when such a board is installed in an ExpressStation system.

System Memory Map

Starting address	Hex address range	Size	Function
0KB	0000-0000 to 0007-FFFF	512KB	Base memory
512KS	0008-0000 to 0009-FBFF	127KB	Base memory enabled in SETUP or System Configuration utility
639KB	0009-FC00 to 0009-FFFF	1 KB	Extended BIOS data segment
640KB	000A-0000 to OWB-FFFF	128KB	Video display RAM
768KB	000C-0000 to 000C-7FFF	32KB	Vi ROM BIOS shadow area (unused it video shadow is disabled)
800KB	000C-8000 to 000C-FFFF	32KB	Built-in SCSI BIOS (unused if SCSI is disabled)
832KB	OOOD-OOOOto000D-FFFF	64KB	Unused (available for expansion card RAM/ ROM)
896KB	000E-0000 to 000F-FFFF	128KB	System BIOS
1MB	0010-0000 to 07FF-FFFF	127MB	Extended memory/EISA expansion area
128MB	0800-0000 to FFFD-FFFF	3968MB	EISA expansion area
4GB-128KB	FFFE-0000 to FFFF-FFFF	128KB	System BIOS alias area

Notes:

1 Not all video modes are used at the same time. You can save some memory by defining which video modes you are using. Typically, 0B-0000H to 0B-7FFFH is only used when you attach a monochrome monitor. Both the text and graphic VGA modes are often used when you attach a VGA monitor.

2 You can remap the video BIOS to 0C-0000H using the SETUP program or the System Configuration utility if your applications require the video BIOS to reside at that location. Do not enable remapping to 0C-0000H unless your application requires it; this saves 32KB of memory for other uses. Tha built-in video BIOS is always located al 0E-0000H.

3 You oan shadow external ROM BIOS information to memory between 0C-0000H and 0D-FFFFH using the SETUP program or the System Configuration utility. The option allows you to begin the shadow block at each 16KB boundary.

4 Borne memory managers, such as QEMM-386,• move the extended BIOS data area from 09-FC00H to a tower address in base memory to provide more contiguous memory above the area used by MS-DOS.

Hard Disk Drives

The following table lists the types of hard disk drives you can use in your computer. Check this table and the manual that came with your hard disk to find the correct type for the hard disk drive(s) installed in your computer.

Note: Be sure you enter the correct drive type or parameters for your drive; if they *are incorrect, the computer will not recognize your drive.*

Hard disk drive types

Type	Cyl	Hds	PC	Sect	Size
01	305	4	126	17	10MB
02	—	—	—	—	user definable
03	—	—	—	—	user definable
04	940	8	512	17	62MB
05	940	6	512	17	46MB
06	615	4	–1	17	20MB
07	462	8	256	17	30MB
08	733	5	–1	17	30MB
09	900	15	–1	17	112MB
10	820	3	–1	17	20MB
11	855	5	–1	17	35MB
12	855	7	–1	17	49MB
13	306	8	128	17	20MB
14	733	7	-1	17	42MB
16	1612	4	0	17	20MB
17	977	5	300	17	40MB
18	977	7	–1	17	56MB
19	1024	7	512	17	59MB
20	733	5	300	17	30MB
21	733	7	300	17	42MB
22	733	5	300	17	30MB
23	306	4	0	17	10MB
24	903	4	-1	46	81MB
25	776	6	-1	33	100MB
26	—	—	—	—	unused
27	698	7	300	17	40MB
26	976	5	466	17	40MB
29	—	—	—	—	unused
30	—	—	—	—	unused
31	732	7	300	17	42MB
32	1023	5	–1	17	42MB
33	901	5	–1	53	116MB
34	723	13	–1	51	234MB
35	834	16	-1	17	124MB
35	—			—	unused
37	683	16	-1	38	202MB
38	548	6	-1	38	61MB
39	761	6	-1	39	115MB
40	960	10	-1	17	61MB
41	1022	5	–1	34	84MB
42	1022	5	–1	36	89MB
43	1024	8	512	17	68MB
44	828	10	–1	34	137MB
45	1024	5	512	17	42MB
46	615	8	128	17	40MB
47	—	—	—	—	unused
48	—	—	—	—	user definable
49	—	-	—		user definable

SIMM Installation

The ExpressStation comes with 4MB of memory provided by one 4MB SIMM (single inline memory module) installed on the main system board. You can install additional SIMMs to increase your computers memory to 32MB.

There are four SIMM sockets on the main system board. Each socket can contain either a single-sided or double-sided SIMM. The SIMMs must all be 80ns (nanosecond), 36-bit, 72-pin, gold-leaded, fast-page mode SIMMs.

Be sure to follow these guidelines when you install SIMMs:

- All SIMMs must be the **same** capacity
- You can Install one, two, or four SIMMs; you cannot install three SIMMs
- Install multiple SIMMs for the best performance; for example, install two 4MB SIMMs instead of one 8MB SIMM
- Install the SIMMs in the sockets closest to the front of the main system board first.

Note: To install 32MB of memory, you must remove the 4MB SIMM that came with your system and installfour 8MB SIMMs when they became available.

Error Codes and Messages

If the computer finds an error, it reports one of the following types of error messages:

- Power-on diagnostic and boot error messages
- Error tone codes for fatal errors (that lock up the system)
- Error tone codes for non-fatal errors (that do not lock up the system).

Power-on Diagnostic and Boot Errors

When the power-on diagnostic tests detect an error, the computer displays a message on the screen (as described below) and the speaker beeps twice. If the error occurs before the computer initializes the video display, the speaker sounds a series of beeps (described in the next section).

Each error is identified by a message number and a countdown number which the computer uses as it executes the test associated with the error. For example, the following message is countdown number 100 and error message number 0018:

```
100 (0018): Invalid configuration information - please run SETUP
```

The table below lists the power-on diagnostic and boot error messages, and some basic solutions to the problems. Check the appropriate section(s) in this appendix for other solutions.

Power-on diagnostic and boot error messages

Countdown number	Error message number	Message	Solution
240	0007	No timer tick	Contact your dealer
200	0001	Gate A20 failure	Contact your dealer
190	0009	Timer 2 failure	Contact your dealer
180	0010	Keyboard stuck key Keyboard controller Keyboard clock line Keyboard data line Keyboard failure	Check the keyboard connection; if it is connected, the keyboard or controller may have failed; contact your dealer
170	0041	Pointer device failure	
160		640 KB base memory 0 KB extended memory	
150	0017	Time of day clock stopped	Contact your dealer
100	0018	Invalid configuration information	Run SETUP
090	0011	Diskette drive failure	Run SETUP and check all connections; contact your dealer it problem persists
080	0015	Hard disk controller failure	Run SETUP and check all connections; contact your dealer if problem persists
090	0016	Hard disk 0 failure	Run SETUP and check all connections; contact your dealer if problem persists
070	0043	No SCSI BIOS found at *nnnn*	Run SETUP and check all SCSI connections; contact your dealer if problem persists
060	0021	*nnnn*0h optional ROM bad Checksum = *nn*	Correct the address conflict or replace the ROM chip; contact your dealer if problem persists-
050	0019	Time of day not set	Run SETUP and set the time and date
040	0020	Keyboard is locked	Unlock the keyboard
	0022	To continue press Esc To enter SETUP press F1	Press F1 to display the error message and follow the instructions on the screen to run the SETUP program or System Configuration utility
020	none	Enable NMI	
010	none	Enable cache	
000	none	Boot	

Error Tone Codes

If power-on diagnostic tests detect an error but cannot display an error message, the computer sounds an error tone code. The tone code is a distinct pattern of beeps that identifies the error, such as one beep-two beeps—one beep. If the error is serious (fatal) the computer locks up, but if the error is not serious (non-fatal) you can continue using your computer.

The tables below list the fatal and non-fatal error codes.

Error *tone* codes *for* fatal *errors*

Error tone code	Description
1-1-3	Real-lime clock write/read failure
1-1-4	ROM BIOS checksum failure
1-2-1	Programmable interval timer failure
1-2-2	DMA initialization failure
1-2-3	DMA bade register write/read failure
1-3-1	RAM refresh verification failure
1-3-3	First 64KB RAM chip or data line failure (multi-bit)
1-3 4	First 64KB RAM odd/even logic failure
1-4-1	First 64KB RAM address line failure
1-4-2	First 64KB RAM parity test In progress failure
2-1 -1	First 64KB RAM failure—bit 0
2-1 -2	First 64KB RAM failure-bit 1
2-1-3	First 64KB RAM failure—bit 2
2-1 4	First 64KB RAM failure—bit 3
2-2-1	First 64KB RAM failure—bit 4
2-2-2	First 64KB RAM failure—bit 5
2-2-3	First 64KB RAM failure—bit 6
2-24	First 64KB RAM failure-bit 7
2-3-1	First 64KB RAM failure—bit 8
2-3-2	First 64KB RAM failure—bit 9
2-3-3	First 64KB RAM failure—bit A
2-34	First 64KB RAM failure-bit B
2 4 1	First 64KB RAM failure—bit C
2 4 2	First 64KB RAM failure—bit D
2-4-3	First 64KB RAM failure—bit F
2 4 4	First 64KB RAM failure—bit F
3-1 -1	Slave DMA register failure
3-1 -2	Master DMA register failure
3-1 -3	Master interrupt mask register failure
3-1 4	Slave interrupt mask register failure
3-24	Keyboard/mouse controller test failure

Error tone codes for non-fatal errors

Error tone code	Description
3-34	Screen memory test failure
34-1	Screen initialization test failure
3 4 2	Screen retrace test failure

Information Reference List

Engineering Change Notices

None.

Technical Information Bulletins

None.

Product Support Bulletins

None.

Related Documentation

TM-EXPRESS	ExpressStation Service Manual
PL-EXPRESS	ExpressStation Parts Price List
SPKEXPRESS	ExpressStation Self Paced Kit
Y74399100600	ExpressStation User's Guide
Y74399100300	ExpressStation Software Guide
Y74399100200	ExpressStation Setup Guide